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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/803,105	03/12/2001	Mitsuyuki Fujibayashi	1272.C0451	6436

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EXAMINER

MOUTTET, BLAISE L

ART UNIT PAPER NUMBER

2853

DATE MAILED: 08/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/803,105

Applicant(s)

FUJIBAYASHI ET AL. **AK**

Examiner

Blaise L Mouttet

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Applicant's amendment of July 28, 2004 has overcome the claim objections of the prior office action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by Norum et al. US 5,923,344.

Norum et al. discloses a printing method for printing an image on a printing medium while relatively moving a printing head provided with an array of a plurality of printing elements and the printing medium (column 1, lines 7-9) comprising the steps of:

relatively moving the printing head and the printing medium in a scanning direction crossing the array of printing elements so that an array of printed pixels (71-78) corresponding to the array of the printing elements is printed on the printing medium (figure 3, column 4, lines 10-27);

detecting printing positions of the array of printed pixels by detecting printed pixels printed by any of the plurality of printing elements (column 6, lines 15-23);

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determining all of the printing elements from among the plurality of printing elements that have displacement amounts of printing positions of corresponding printed pixels from a printing position of a printed pixel corresponding to one end side of the array of printing elements equal to or greater than a predetermined amount (as shown and described in relation to figures 3 and 9 the printing elements that produce displacement amounts of pixels greater than one pixel from the end pixel 78 are determined); and

adjusting drive timing of the plurality of printing elements according to detection results of the printing positions so as to make printing positions of subsequently printed pixels close to a predetermined center position (as described in relation to figures 3, 4 and 9), wherein said adjusting step adjusts drive timing of all of the printing elements that are determined in said determining step so that a deviation amount between printing positions of printed pixels corresponding to one end side and the other end side of the array of printing elements is equal to or smaller than the predetermined value (figures 3 and 4, column 4, lines 10-47),

wherein all of the printing elements determined in the determining step exclude the one end side of the array of printing elements (the nozzle used to print end pixel 78 is not determined to have a displacement amount as indicated in figures 3 and 4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4, 5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norum et al. US 5,923,344 in view of Perner US 6,227,644.

Norum et al. discloses, regarding claim 1, a printing apparatus for printing an image on a printing medium while relatively moving a printing head provided with an array of a plurality of printing elements and the printing medium (column 1, lines 7-18), said apparatus comprising:

a carriage mounting said printing head and movable relative to the printing medium in a scanning direction crossing said array of printing elements (figure 3, column 4, lines 6-9);

detection means for detecting printing positions of an array of printed pixels corresponding to said array of said plurality of printing elements, said detecting means detecting printed pixels printed by any of said plurality of printing elements (column 6, lines 15-23);

determining means for determining all of the printing elements from among the plurality of printing elements that have displacement amounts of printing positions of corresponding printed pixels from a printing position of a printed pixel corresponding to one end side of said array of printing elements equal to or greater than a predetermined

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amount (processor of printer for interpreting detected printing position and generating dot shift data as taught in column 6, lines 20-23); and

control means (11) for adjusting drive timing of said plurality of printing elements according to detection results of said detection means so as to make printing positions of subsequently printed pixels close to a predetermined center position, said control means adjusting the drive timing of all of said printing elements determined by said determining means so that a deviation amount between printing positions of printed pixels corresponding to one end side and the other end side of the array of printing elements is equal to or smaller than the predetermined value (column 4, lines 10-38).

wherein all of the printing elements determined by the determining means exclude the one end side of the array of printing elements (the nozzle used to print end pixel 78 is not determined to have a displacement amount as indicated in figures 3 and 4).

Regarding claim 2, the control means adjusts the drive timing makes the deviation amount less than a size of one pixel (column 4, lines 28-38).

Regarding claim 4, moving means for the carriage carrying the printing head is inherent to move the printing head in direction as taught in column 4, lines 6-9 and transportation means for the print media is inherent to move the paper as taught in column 1, lines 39-40.

Regarding claims 9 and 10, the printing elements contain electrothermal converters for ejecting ink (column 3, lines 35-36).

Norum et al. fails to disclose, regarding claim 1, that the detection means is mounted on said carriage.

Norum et al. fails to disclose, regarding claim 5, that the detection means includes a plurality of detection elements arranged on the carriage in a direction crossing the scanning direction.

Norum et al. fails to disclose, regarding claim 8, that the detection means comprises a light source and photoelectric detector.

Perner discloses, regarding claims 1, 5 and 8, detection means (15) mounted on a carriage with a printing head (10) to detect ink drop positions from the printing head (figure 1, column 2, lines 13-15). A plurality of detection elements are included crossing the scanning direction (figure 1, column 3, lines 20-28) and the detection means employs light sources and photodetectors (column 3, lines 39-49, column 6, lines 7-17).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to utilize the carriage mounted detector of Perner to determine the ink drop positions as taught by Norum et al.

The motivation for doing so would have been to finely detect ink drop position for each drop automatically as taught by column 1, lines 57-67 of Perner.

4. Claims 1-4 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norum et al. US 5,923,344 in view of Beauchamp et al. US 5,448,269.

Norum et al. discloses, regarding claim 1, a printing apparatus for printing an image on a printing medium while relatively moving a printing head provided with an

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array of a plurality of printing elements and the printing medium (column 1, lines 7-18),
said apparatus comprising:

a carriage mounting said printing head and movable relative to the printing medium in a scanning direction crossing said array of printing elements (figure 3, column 4, lines 6-9);

detection means for detecting printing positions of an array of printed pixels corresponding to said array of said plurality of printing elements, said detecting means detecting printed pixels printed by any of said plurality of printing elements (column 6, lines 15-23);

determining means for determining all of the printing elements from among the plurality of printing elements that have displacement amounts of printing positions of corresponding printed pixels from a printing position of a printed pixel corresponding to one end side of said array of printing elements equal to or greater than a predetermined amount (processor of printer for interpreting detected printing position and generating dot shift data as taught in column 6, lines 20-23); and

control means (11) for adjusting drive timing of said plurality of printing elements according to detection results of said detection means so as to make printing positions of subsequently printed pixels close to a predetermined center position, said control means adjusting the drive timing of all of said printing elements determined by said determining means so that a deviation amount between printing positions of printed pixels corresponding to one end side and the other end side of the array of printing elements is equal to or smaller than the predetermined value (column 4, lines 10-38).

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wherein all of the printing elements determined by the determining means exclude the one end side of the array of printing elements (the nozzle used to print end pixel 78 is not determined to have a displacement amount as indicated in figures 3 and 4).

Regarding claim 2, the control means adjusts the drive timing makes the deviation amount less than a size of one pixel (column 4, lines 28-38).

Regarding claim 4, moving means for the carriage carrying the printing head is inherent to move the printing head in direction as taught in column 4, lines 6-9 and transportation means for the print media is inherent to move the paper as taught in column 1, lines 39-40.

Regarding claims 9 and 10, the printing elements contain electrothermal converters for ejecting ink (column 3, lines 35-36).

Norum et al. fails to disclose, regarding claim 1, that the determination of the printing positions of the pixels is made by detection means mounted on said carriage.

Norum et al. fails to disclose, regarding claim 3, that the printing head is replaceably mounted while detection means is fixed to the carriage.

Norum et al. fails to disclose, regarding claim 7, a plurality of printing heads mounted on the carriage with detection means wherein the printing heads are controlled based on detection results of the detection means.

Norum et al. fails to disclose, regarding claim 8, detection means comprising a light source and photoelectric detector.

Beauchamp et al. discloses, regarding claims 1, 3, 7 and 8, a replaceably mounted set of print heads (102-108) placed in a carriage (100) as indicated by column 1, lines 49-53 and figure 2 and detection means (200) comprising light sources and photodetectors (column 6, lines 15-24) fixedly mounted on the carriage (100) to detect ink drop patterns from the print heads and control the print heads accordingly (abstract).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize replaceable printing heads as shown by Beauchamp et al. in the apparatus of Norum et al.

The motivation for doing so would have been to replace a printing head when it is faulty.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize detection means mounted on the carriage as taught by Beauchamp et al. to determine the ink drop positions as taught by Norum et al.

The motivation for doing so would have been to provide appropriate calibration automatically as taught by column 2, lines 46-51 of Beauchamp et al.

Response to Arguments

5. Applicant's arguments filed July 28, 2004 have been fully considered but they are not persuasive.

The applicant has included amendments to the claims reciting that the printing elements determined in the determining step or by the determining means exclude the one end side of the array of printing elements and has argued that the end dot 78 of

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Norum et al. can not be considered a "base mark" even though the end dot is not corrected but is instead kept fixed in the example described by Norum et al.

The examiner disagrees and contends that end dot 78 of Norum et al. may be considered a base mark at least for the example described in relation to figures 3 and 4 of Norum et al. While under the broad disclosure of the invention of Norum et al. a displacement amount of the position of end dot 78 **may be** determined this does not eliminate the specific embodiments of figures 3 and 4 of Norum et al., in which the displacement amount of end dot 78 **is not** determined, from the prior art. See MPEP 2123 which notes that even non-preferred or non-optimal embodiments may be applied as prior art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

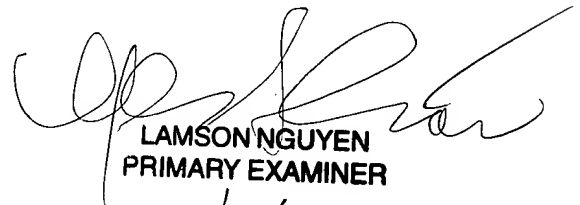
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Blaise Mouttet who may be reached at telephone number (571) 272-2150. The examiner can normally be reached on Monday-Friday from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier, Art Unit 2853, can be reached at (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Blaise Mouttet August 13, 2004

Bm 8/13/2004


LAMSON NGUYEN
PRIMARY EXAMINER
08/16/04